**Supplementary file 1: characteristics of forelimb and hindlimb bones in control and ninein-deleted mice.**

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|  |  Forelimb |  |  |  | Hindlimb |  |  |
|  | ***Scapula*** | ***Humerus*** | ***Ulna*** | ***Radius*** | ***Femur*** | ***Tibia*** | ***Fibula*** |
| *E16.5 bone length (mm)*  |  |  |  |  |  |  |  |
| *Del/+**Del/Del*  | 2.86 ± 0.092.77 ± 0.14 | 2.94 ± 0.092.83 ± 0.13 | 2.90 ± 0.102.87 ± 0.13 | 2.29 ± 0.082.24 ± 0.11 | 2.46 ± 0.082.37 ± 0.12 | 2.52 ± 0.102.42 ± 0.12 |  2.32 ± 0.102.25 ± 0.14 |
| *E16.5 mineralized bone length (mm)*  |  |  |  |  |  |  |  |
| *Del/+**Del/Del* | 1.45 ± 0.071.43 ± 0.10 | 1.52 ± 0.081.44 ± 0.10 | 1.73 ± 0.081.70 ± 0.12 | 1.37 ± 0.061.36 ± 0.09 | 1.18 ± 0.061.14 ± 0.09 | 1.47 ± 0.071.43 ± 0.09 | 1.30 ± 0.061.29 ± 0.09 |
|  |  |  |  |  |  |  |  |
| *E18.5 bone length (mm)*  |  |  |  |  |  |  |  |
| *Del/+**Del/Del*  | 3.97 ± 0.044.04 ± 0.02 | 4.13 ± 0.034.19 ± 0.02 | 4.16 ± 0.054.22 ± 0.06 | 3.23 ± 0.033.23 ± 0.03 | 3.61 ± 0.033.71 ± 0.02 |  3.78 ± 0.053.84 ± 0.03 | 3.50 ± 0.033.52 ± 0.04 |
| *E18.5 mineralized bone length (mm)*  |  |  |  |  |  |  |  |
| *Del/+**Del/Del* | 2.38 ± 0.032.41 ± 0.03 | 2.50 ± 0.042.51 ± 0.03 | 2.87 ± 0.042.91 ± 0.03 | 2.27 ± 0.032.33 ± 0.03 | 2.03 ± 0.042.05 ± 0.03 |  2.49 ± 0.042.49 ± 0.05 | 2.31 ± 0.042.33 ± 0.04 |
|  |  |  |  |  |  |  |  |

Data are expressed as means with their standard errors. At E16.5, 18 control and 11 ninein-deleted embryos were analyzed. At E18.5, 20 control and 12 ninein-deleted embryos were analyzed. No difference in the total length and size of the mineralized area was observed in controls and ninein-deleted embryos.